

We claim:

1. A functional monitoring system, comprising:

a transmitting and receiving station configured to transmit an interrogation code signal; and

a plurality of transponders each configured to respond to the interrogation code signal upon receiving the interrogation code signal and to generate a response signal and transmit the response signal to said transmitting and receiving station.

2. The functional monitoring system according to claim 1, wherein said transmitting and receiving station is selectively configured to transmit the interrogation code signal at regular intervals, at irregular intervals, or as a reaction to a triggering event.

3. The functional monitoring system according to claim 1, wherein each of said transponders includes a synchronization device effecting a synchronization of a transponder operation with the interrogation code signal received by said transponder, such that the response signals of said transponders are transmitted in synchronization.

4. The functional monitoring system according to claim 3, wherein said synchronization device effects a synchronization

of the transponder operation to a code signal sequence transmitted with the interrogation code signal.

5. The functional monitoring system according to claim 3, wherein said synchronization device effects a synchronization of a transmission signal generation of said plurality of transponders.

6. The functional monitoring system according to claim 1, wherein at least one of said transponders contains a subcarrier frequency generator for generating a subcarrier frequency signal, assigned to said transponder, for modulation of a carrier frequency signal common to all of said transponders.

7. The functional monitoring system according to claim 6, wherein said transponder comprises a carrier frequency generator generating a carrier frequency signal, a first modulator for modulating the subcarrier frequency signal generated by said subcarrier frequency generator with a code signal, and a second modulator for modulating the carrier frequency signal generated by said carrier frequency generator with the output signal output by said first modulator.

8. The functional monitoring system according to claim 6, wherein said transmitting and receiving station comprises a

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plurality of input channels with filters for filtering out frequency components caused by the subcarrier frequency signal.

9. The functional monitoring system according to claim 1, wherein each of said plurality of transponders contains a subcarrier frequency generator for generating a subcarrier frequency signal, assigned to the respective said transponder, for modulation of a carrier frequency signal common to all of said transponders

10. The functional monitoring system according to claim 9, wherein each of said transponders comprises a carrier frequency generator generating a carrier frequency signal, a first modulator for modulating the subcarrier frequency signal generated by said subcarrier frequency generator with a code signal, and a second modulator for modulating the carrier frequency signal generated by said carrier frequency generator with the output signal output by said first modulator.

11. The functional monitoring system according to claim 9, wherein said transmitting and receiving station comprises a plurality of input channels with filters for filtering out frequency components caused by the subcarrier frequency signal.

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12. The functional monitoring system according to claim 1, wherein said transmitting and receiving station forms a part of an access control system.

13. The functional monitoring system according to claim 1, wherein said transmitting and receiving station is mounted at a motor vehicle and the monitoring system is a motor vehicle access control system.

14. A method of operating a functional monitoring system having a transmitting and receiving station and a plurality of transponders, the method which comprises:

transmitting an interrogation code signal with a transmitting and receiving station; and

simultaneously responding with each of a plurality of transponders receiving the interrogation code signal by transmitting a response signal.

15. The method according to claim 14, which comprises transmitting the interrogation code signal at regular time intervals.

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16. The method according to claim 14, which comprises transmitting the interrogation code signal at irregular time intervals.

17. The method according to claim 14, which comprises transmitting the interrogation code signal as a reaction to a triggering event.

18. The method according to claim 14, which comprises synchronizing the transponders for transmitting the response signal.

19. The method according to claim 14, which comprises generating the respective response signals by double modulation with an initial modulation of a subcarrier frequency signal with an response code signal and a subsequent modulation of a carrier frequency signal, common to all of the transponders, with the modulation output signal obtained in the initial modulation.

20. The method according to claim 19, which comprises evaluating with the transmitting and receiving station the frequency components caused by the subcarrier frequency signals of the individual transponders in different channels.